

The Amount of Water We Eat

By John Letey and David Birkle. Originally published in *Currents*, A Newsletter of the University of California Water Resources Center (Winter 2003, Volume 4, Issue 1)

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The fact that the amount of water used in growing agricultural crops in California is much greater than the amount of water used in cities is well publicized. Values of 80-85 percent of developed water going to agriculture are commonly reported. Less understood is the fact that large quantities of water are indirectly delivered to the city via food. The late professor Robert Hagan recognized this and was instrumental in initiating a study to quantify the water used to produce various foods in California.

Marcia Kreith, with guidance from an advisory committee, which Professors Robert Hagan and Henry Vaux Jr. co-chaired, prepared a report for the Water Education Foundation dated September 27, 1991, entitled "Water Inputs in California Food Production." The assumptions made for the analyses are reported in detail. The basic approach was to divide the weighted statewide average evapotranspiration by the weighted statewide average yield for a crop to determine the gallons of water per pound of food produced. Because it is impossible to irrigate so that all the water delivered to a farm is used for evapotranspiration, the calculated number was divided by 0.7.

We used the values from the report to calculate the amount of water used to produce the food for a

specific daily diet. However, we multiplied each value by 0.7 before using them so that our numbers are conservative and represent only the water lost through evapotranspiration. We used a 2,200-calorie menu proposed by the U.S. Department of Agriculture Food, Nutrition and Consumer Service.

Breakfast was 1 medium orange, 1 banana, 1 bowl of dry cereal, 1 muffin, 2 pats of butter and 1/2 cup of milk, which totaled 130 gallons of water. Lunch was a taco salad and 2 ginger snaps which totaled 275 gallons of water. Dinner was chicken-vegetable stir-fry, cooked broccoli, 2 slices of bread, 2 pats of butter, and a fruit cup for a total of 220 gallons of water. Snacks consisted of 6 wheat crackers, 6 oz of yogurt and 1/2 cup of orange juice for a total of 83 gallons. The daily total was 708 gallons of water.

The daily amount of water used per person in a city home is variable, but 125 gallons/day is a typical value. For our scenario the city person uses a total of 833 gal/day of which 708 (85 percent) is for producing the food. The result that the percentage of water used to produce food is about the same as the percent of water delivered to agriculture is coincidental, but nevertheless illustrates the magnitude of the water delivered to agriculture that indirectly passes on to the urban dweller. ♦

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